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10/756,371	01/14/2004	Yong Beom Kim	8733.048.20-US	2355

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EXAMINER	
DI GRAZIO, JEANNE A	
ART UNIT	**PAPER NUMBER**
2871	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/756,371	KIM ET AL.	
	Examiner	Art Unit	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,13 and 14* is/are pending in the application.

4a) Of the above claim(s) *13 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/536,636.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims

Claims 1-10 are pending with claims 13 and 14 currently withdrawn from further consideration pursuant to Applicant's election without traverse of Species A (claims 1-10) in the reply filed on July 2, 2004. As Applicant has noted in Applicant's Response of December 22, 2004, claims 11 and 12 have previously been cancelled per Preliminary Amendment of January 14, 2004.

Priority

Priority to Korean Patent Applications 1999-11108 (March 31, 1999) and 1999-48411 (Nov. 3, 1999) is claimed. This is a continuation of United States Patent Application 09/536,636 (March 28, 2000) now United States Patent 6,693,689.

Other Documents Acknowledged

The Examiner acknowledges (1) Applicant's Request for a Corrected Filing Receipt in Paper of December 22, 2004 and (2) Applicant's correction to the title of the invention in Paper of December 22, 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of United States Patent 6,339,464 B1 (to Anderson et al.) and further in view of United States Patent 5,493,430 (to Lu et al.).

As to claim 1, APA Figure 1 illustrates a conventional reflective liquid crystal display comprising the following elements: a linear polarizer for converting natural light into linearly polarized light (26), a retardation film (24) for converting the linearly polarized light into circularly polarized light and a liquid crystal layer (16) for receiving the circularly polarized light

and varying the phase of the circularly polarized light depending on the presence of an applied electric field (electrodes 18 and 14 apply an electric field to the liquid crystal layer).

APA Figure 1 does not appear to explicitly specify a cholesteric liquid crystal color filter for receiving the circularly polarized light from the liquid crystal layer, and selectively reflecting the circularly polarized light received from the liquid crystal layer.

Anderson teaches and discloses a filter and method of making an optical device (Title, entire patent). Anderson teaches that cholesteric color filters are especially preferable for several reasons. Cholesteric color filters can be used in systems with a large optical flux such as in projector systems and because unwanted light is reflected rather than absorbed, the filters are subjected to less thermal stress. The result is a display in which improved color stability and operating life is achieved (Anderson at Column 2, Lines 66-67 and Column 3, Lines 1-4

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Anderson for a filter subjected to less thermal stress so that color stability is improved and operating life is improved.

APA Figure 1 does not appear to explicitly specify a black background for absorbing a portion of light passing through the color filter.

Please note that a black background for absorbing a portion of light passing through a color filter is conventional. However, the Examiner notes the Lu reference as follows.

Lu teaches and discloses a color reflective liquid crystal display (Title, entire patent). Lu teaches that typical reflective displays include a back plate that is painted black to absorb any non-reflected light. Lu teaches that as a result of the black paint on the back plate, the displays show the contrast of green, yellow or such other color determined by the cholesteric material

pitch and black is preferred because it can provide for high contrast ratios (Lu at Column 1, Lines 35-42).

Please note that Applicant claims a black background for absorbing **a portion of light** passing through the color filter. Even if the Lu black background does not absorb all colors or treat all wavelength colors equally, it still absorbs **a portion of light** and is consistent with both Anderson and the noted claim limitation.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Lu at least for contrast and for high contrast ratios. Furthermore, such a black background is conventional. Please see response to Arguments below.

As to claim 2, APA discloses that the retardation film is a $\lambda/4$ plate.

As to claim 3, Lu teaches that a *back* plate is painted black to absorb any non-reflected light. Thus, the black back plate is presumably beneath a color filter.

As to claim 4, APA Figure 1 shows that the retardation film (24) is located between the linear polarizer (26) and the color filter (20).

As to claim 5, because the Lu back plate is painted black, it may be presumed that the black background is of a polymeric material.

As to claim 6, Anderson teaches and discloses that the cholesteric color filter bandwidth can be controlled by adjusting the pitch of the cholesteric liquid color filter (for example, Column 1, Lines 65-67 and Column 2, Line 1 and entire patent).

Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of United States Patent 4,589,734 (to Needham et al.) and further in view of United States Patent 6,339,464 B1 (to Anderson et al.) and further in view of United States Patent 5,493,430 (to Lu et al.).

As to claim 7, APA Figure 1 discloses a conventional reflective liquid crystal display in which first and second substrates (10 and 12) are opposite to and spaced apart from each other and a liquid crystal layer (16) interposed between the first (10) and second (12) substrates. Twisted nematic (TN) or super twisted nematic (STN) liquid crystal material, by way of non-limiting example, has at least a first switching mode in which a phase of light is changed while passing through the TN or STN material and a switching mode in which the phase of light is not changed while passing through the TN or STN material. APA Figure 1 discloses first (18) and second (14) electrodes for applying an electric field to the liquid crystal layer (16), a retardation film (24) located on the first substrate (10) for converting linearly polarized light into circularly polarized light, a linear polarizer (26) located on the retardation film (24), for converting linearly polarized light into circularly polarized light and a color filter (20).

APA does not appear to explicitly specify a semiconductor element for switching an electric signal applied to the liquid crystal layer.

Needham teaches and discloses a semiconductor wafer in the context of a polychromatic liquid crystal display and cholesteric material (entire patent). With reference to Figure 1, the

silicon wafer (4) is located on a bottom substrate (second substrate) and applies a signal to the liquid crystal layer such that a polychromatic display is obtained (entire patent).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Needham for polychromatic display.

APA Figure 1 does not appear to explicitly specify a cholesteric liquid crystal color filter for receiving the circularly polarized light from the liquid crystal layer, and selectively reflecting the circularly polarized light received from the liquid crystal layer.

Anderson teaches and discloses a filter and method of making an optical device (Title, entire patent). Anderson teaches that cholesteric color filters are especially preferable for several reasons. Cholesteric color filters can be used in systems with a large optical flux such as in projector systems and because unwanted light is reflected rather than absorbed, the filters are subjected to less thermal stress. The result is a display in which improved color stability and operating life is achieved (Anderson at Column 2, Lines 66-67 and Column 3, Lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Anderson for improved color stability and operating life.

APA Figure 1 does not appear to explicitly specify a black background for absorbing a portion of light passing through the color filter.

Please note that a black background for absorbing a portion of light passing through a color filter is conventional. However, the Examiner notes the Lu reference as follows.

Lu teaches and discloses a color reflective liquid crystal display (Title, entire patent). Lu teaches that typical reflective displays include a back plate that is painted black to absorb any non-reflected light. Lu teaches that as a result of the black paint on the back plate, the displays show the contrast of green, yellow or such other color determined by the cholesteric material pitch and black is preferred because it can provide for high contrast ratios (Lu at Column 1, Lines 35-42).

Please note that Applicant claims a black background for absorbing **a portion of light** passing through the color filter. Even if the Lu black background does not absorb all colors or treat all wavelength colors equally, it still absorbs **a portion of light** and is consistent with both Anderson and the noted claim limitation.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Lu for contrast and for high contrast ratios. Furthermore, such a black background is conventional. Please see response to Arguments below.

As to claim 8, APA discloses that the retardation film is a $\lambda/4$ plate.

As to claim 9, because the Lu back plate is painted black, it may be presumed that the black background is of a polymeric material.

As to claim 10, Anderson teaches and discloses that the cholesteric color filter bandwidth can be controlled by adjusting the pitch of the cholesteric liquid color filter (for example, Column 1, Lines 65-67 and Column 2, Line 1 and entire patent).

Response to Arguments

Applicant's arguments filed December 22, 2004 have been fully considered but they are not persuasive.

The Examiner notes with appreciation Applicant's remarks of December 22, 2004 and telephone interview of May 5, 2005 with Applicant's Representative, Mr. Kurt Eaton. A copy of the Interview Summary will be mailed to Applicant's Representative(s).

Applicant's only argument focuses on the issue of a black background for absorbing light with respect to a cholesteric color filter.

Applicant states, in sum, that it would not have been obvious to modify APA and Anderson in view of Lu (the reference that teaches the incorporation of a black background) and that Lu teaches away from using a black background for certain colors. Please see Remarks at page 5 of 7.

However, please note that a black background for absorbing light with respect to a cholesteric color filter is conventional. For purposes of explanation, the Examiner respectfully directs Applicant's attention to United States Patent 4,061,417 (issued to Katagiri).

Katagiri states "Conventional color display devices using cholesteric liquid crystal compounds are divided into two types; the reflection type and the transmission type. **In reflection type devices, good contrast is not readily obtainable if the transmitted light is not absorbed by a black background.**" (Emphasis added)(Column 1, Lines 19-26).

Therefore, for at least 30 years, at least since the filing date of Katagiri – November 6, 1975 – foreign priority of November 14, 1974 – it has been established that a black background is critical in a reflective cholesteric display in order for the device to have good contrast.

Lu is directed to a black background for improved contrast.

Therefore, the Examiner believes that the motivation for using the Lu reference is proper and valid.

On another note, *even if* the Lu black background does not absorb all colors or treat all wavelength colors equally, it still absorbs **a portion of light** (as claimed by Applicant) and is consistent with both Anderson and the noted claim limitation.

Therefore, the Examiner believes that the Examiner's Rejections are proper and valid.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Patent Examiner
Art Unit 2871

DUNG T. NGUYEN
PRIMARY EXAMINER

JDG